# An extended Gauss-Seidel method for multi-valued mixed complementarity problems

Allevi E., Gnudi A., Konnov I.
*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

## Abstract

The complementarity problem (CP) is one of the basic topics in nonlinear analysis. Since the constraint set of CP is a convex cone or a cone segment, weak order monotonicity properties can be utilized for its analysis instead of the usual norm monotonicity ones. Such nonlinear CPs with order monotonicity properties have a great number of applications, especially in economics and mathematical physics. Most solution methods were developed for the single-valued case, but this assumption seems too restrictive in many applications. In the paper, we consider extended concepts of multi-valued Z-mappings and examine a class of generalized mixed complementarity problems (MCPs) with box constraints, whose cost mapping is a general composition of multi-valued mappings possessing Z type properties. We develop a Gauss-Seidel algorithm for these MCPs. Some examples of computational experiments are also given.

## Keywords

Gauss-Seidel algorithm, Mixed complementarity problem, Multi-valued mappings, Z-mappings